

Edits in Text of

Computation and Problem Solving in Undergraduate Physics (CPSUP)

Date created: 20 February 2023

The date with each item in this list is the date on which the edit was made in the source files from which *CPSUP* is printed. Any copies created on or after that date will reflect the change. Note that the date of creation appears on the cover page of each copy. Note also that some of these edits may impact the exact pagination of the corresponding version of *CPSUP* and may change the numbers on equations, figures, and tables that occur subsequent to the edit in the affected chapter.

- (1 February 2021) The note at the beginning of the LSODE chapter (Chapter 12) was edited to read

Note: All FORTRAN programs (*.f) and all FORTRAN-created data files (*.dat) in this chapter can be copied from the directory \$HEAD/lsode, where (as defined in the *Local Guide*) \$HEAD must be replaced by the appropriate path for your site.

- (1 February 2021) The note at the beginning of Section 9.11 was edited to refer to PYTHON-created data files (not FORTRAN-created data files) and to admit that some PYTHON-created data files are named *_py.dat and others are named *_python.dat.
- (1 February 2021) The phrase “and all FORTRAN-created data files (*.f.dat)” was deleted from the note at the start of Section 13.13. (There are no FORTRAN-created data files in Chapter 13.)
- (1 February 2021) The phrase “and all C-created data files (*.c.dat)” was deleted from the note at the start of Section 13.14. (There are no C-created data files in Chapter 13.)
- (6 February 2021) The omitted bullet before decay.m in MATLAB Section 11.8.10 was restored.
- (7 February 2021) The line at the end of Section 6.16.3 that read “the file c:/users/cookd/testfile.mac and the file c:/users/cookd/testfile.mc will both satisfy the search” was changed to read “the files c:/users/cookd/testfile.mac and c:/users/cookd/testfile.mc, should they exist, will both satisfy the search”. This change was made to avoid confusion because the file c:/users/cookd/testfile.mc, in fact, does not exist in the *CPSUP* distribution.
- (7 February 2021) A footnote was added in Section 11.7.3, specifically, “These procedures are implemented in the files ludiffeq_23.pro and ludiffeq_45.pro. These files may be placed in IDL’s search path and will be found when invoked without specifying a path. They are also available in the directory \$HEAD/idl and can be invoked with that path or copied from there to the default directory, in which they will be found when invoked without specifying a path.” In consequence, the number on each subsequent footnote in Chapter 11 will be incremented by 1.
- (12 February 2021) Because the Numerical Recipes library is proprietary, subroutines and example programs from that library are available only if your site has appropriate licenses. To convey that restriction,
 - The note

Note: If your site owns licenses for the Numerical Recipes library, files in this chapter that are components of the Numerical Recipes library can be downloaded from the directory \$NRHEAD. Here, as defined in the *Local Guide*, \$NRHEAD must be replaced by the appropriate path for your site. The subdirectories in \$NRHEAD are identified in Fig. 10.1.

was added at the beginning of Chapter 10.

- The note at the beginning of Sections 11.14, 13.13, and 14.14 was deleted.
- The note

Note: All FORTRAN programs (*.f) and FORTRAN-generated data files (*.f.dat) in this subsection can be copied from the directory \$HEAD/fortran. \$HEAD for your site is defined in the *Local Guide*.

was added at the beginning of Subsections 11.14.1, 13.13.1, and 14.14.1.

- The note

Note: CPSUP-generated FORTRAN programs (*.f) and FORTRAN-generated data files (*.f.dat) can be downloaded from the directory \$HEAD/fortran. If your site has the appropriate license, files in this subsection from the Numerical Recipes library can be downloaded from a subdirectory of the directory \$NRHEAD (see Fig. 10.1). \$NRHEAD and \$HEAD for your site are defined in the *Local Guide*.

was added at the beginning of Subsections 11.14.2, 13.13.2, and 14.14.2.

- The note

Note: All C programs (*.c) and all C-generated data files (*.c.dat) in this subsection can be copied from the directory \$HEAD/cc. \$HEAD for your site is defined in the *Local Guide*.

was added at the beginning of Subsections 11.15.1, 13.14.1, and 14.15.1.

- The note

Note: CPSUP-generated C programs (*.c) and C-generated data files (*.c.dat) can be downloaded from the directory \$HEAD/cc. If your site has the appropriate license, files in this subsection from the Numerical Recipes library can be downloaded from a subdirectory of the directory \$NRHEAD (see Fig. 10.1). \$NRHEAD and \$HEAD for your site are defined in the *Local Guide*.

was added at the beginning of Subsections 11.15.2, 13.14.2, and 14.15.2.

- (13 February 2021) To make for a more sensible page breaks, the in-line presentation of the tables of values in Subsections 11.14.1, 11.14.2, 11.15.1, and 11.15.2 were replaced by tables placed at the top of an appropriate page. Since these tables are the last tables in Chapter 11, there are no subsequent tables whose numbers will be thereby incremented.
- (28 June 2021) The L^AT_EX coding was adjusted so that the coding in Section 13.8.8, third paragraph (beginning “Second, having defined”) appears properly. This change involves only versions containing OCTAVE.
- (12 September 2021) In Maple Section 7.7.4, replaced the incorrect `vec2` with `Arr1` in the paragraph that introduces the function `Array`.
- (1 October 2021) In second paragraph from the end of Section 5.3.4: Corrected result of statement `print(a[1, :])` to read [4 5 6] instead of [4 6 6].
- (17 October 2021) Adjusted vertical spacing in the second paragraph of Section 11.5.1 so that lines `In[6]`–`In[8]` line up horizontally with their comments.
- (14 November 2021) Changed title on Section 11.1.2 to “Chain Radioactive Decay”.
- (14 November 2021) Exercise 11.30, which originally appeared only in versions of *CPSUP* that included IDL, was recast to apply in any version containing IDL and/or MATLAB and/or OCTAVE and/or PYTHON.

- (14 November 2021) Exercise 11.31 exploring an elastic swing was inserted and the number of each subsequent exercise was hence incremented by one from its number in versions printed before the indicated date.
- (7 December 2021) A cautionary paragraph was added at the end of Section 5.3.4 alerting the reader that the PYTHON statement `arr2=arr1` will *not* make an independent copy of `arr1`. Instead, the statement `arr2 = arr1.copy()` must be invoked.
- (20 December 2021) Section 5.14.5 was added to describe the use of the statement `pause(delay)` as a fairly simple route to creating animations.
- (18 January 2022) A brief paragraph admitting the possibility of dynamic allocation of the sizes of arrays was added at the end of Section 9.1.1.
- (30 March 2022) Information about the FORTRAN package of linear algebra routines (LAPACK) was added to Appendix Z.
- (31 July 2022) The treatment of the functions α , β , and f in Sections 15.9.3 and 15.9.4 was refined to clarify the treatment of these known functions. They are assumed to have representative—though different—values in the several elements in fewer places in the argument than was described in the previous versions of these sections.
- (29 August 2022) A brief description of options to `pdfcrop` was added to Section A.11.
- (11 November 2022) A section containing supplementary problems was added to the IDL, MATLAB, OCTAVE, and PYTHON chapters and Exercises 2.41, 3.40, 4.40, and 5.40 on the Kaprekar Constant were added in those sections.
- (28 November 2022) Exercise 6.4 in MAXIMA, Exercise 7.4 in MAPLE, and Exercise 8.4 in MATHEMATICA embellished and clarified.
- (4 December 2022) Checked and updated URLs in Appendix Z.
- (11 December 2022) Added IDL, MATLAB, OCTAVE, and PYTHON graphs of the solution to Laplace's equation in Sections 9.4 and 9.6.
- (12 December 2022) Standardized 'roundoff', 'round-off', and 'round off' to 'roundoff' throughout text.
- (16 December 2022) Added the alternative way using `subplot` to create Fig. 5.8.
- (17 December 2022) Corrected title of Fig. 5.24 and added direction of electric field to caption.
- (31 December 2022) Chapters 15 (Partial Differential Equations) and 16 (MUDPACK) added.
- (2 January 2023) Completed careful checking of Chapter 5 (PYTHON) and spot checking of later PYTHON discussions to confirm functioning with PYTHON 3.9. Several edits were made to make needed adjustments.

Edits in Solutions to Exercises from

Computation and Problem Solving in Undergraduate Physics (CPSUP)

- (24 October 2021) Solutions to MAXIMA Exercises 6.22 and 6.23 added.
- (27 October 2021) Solutions to MATHEMATICA Exercises 8.21 and 8.22 added.
- (30 October 2021) Solutions to MAPLE Exercises 7.22 and 7.23 added.

- (17 November 2021) Solutions to Exercise 11.31 in IDL, MATLAB, OCTAVE, and PYTHON added.
- (11 November 2022) Solutions to Exercises 2.41 in IDL and Exercises 3.40, 4.40, and 5.40 in MATLAB, OCTAVE, and PYTHON added.
- (28 November 2022) Solutions to Exercise 6.4 in MAXIMA, Exercise 7.4 in MAPLE, and Exercise 8.4 in MATHEMATICA added.
- (12 December 2022) Standardized ‘roundoff’, ‘round-off’, and ‘round off’ to ‘roundoff’ throughout solutions.
- (31 December 2022) Solutions to selected exercises in Chapters 15 (Partial Differential Equations) and 16 (MUDPACK) added.